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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/628,526	07/28/2003	Michael A. Brown	30320/15121	4307

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EXAMINER	
CHU, KIM KWOK	

ART UNIT	PAPER NUMBER
2627	

DATE MAILED: 10/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/628,526	BROWN ET AL.	
	Examiner	Art Unit	
	Kim-Kwok CHU	2627	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 July 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12 and 20-38* is/are pending in the application.

4a) Of the above claim(s) *13-19* is/are withdrawn from consideration.

5)☒ Claim(s) *29-35* is/are allowed.

6)☒ Claim(s) *1,2,6,12,20,21,26,27,36 and 38* is/are rejected.

7)☒ Claim(s) *3-5,7-11,22-25,28 and 37* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Response to Restriction

1. Applicant elects without traverse claims 1-12 and 20-38 from Group 1 in the response to the restriction requirement filed July 31, 2006. Claims 13-19 are withdrawn from consideration.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> *(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.*

3. Claims 1, 2, 6, 12, 20, 21, 26, 27, 36 and 38 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Gibson (U.S. Patent 6,473,388) in view of Libove et al. (U.S. Patent 5,473,244).

4. Gibson teaches a detecting method in a phase change material very similar to that of the present invention as cited in Claims 1, 2, 6 and 12. For example, Gibson teaches the following:

(a) With respect to Claim 1, detecting a variation in resistance within a layered material stack 104 in response to a scanning and injection of a non-contacting, remotely sourced electron stream 118 into the layered material stack 104 (Fig. 1; phase change layer has two resistive state; column 2, lines 22-27); the layered material stack 104 having a first conductive contact layer 106, a second conductive contact layer 122 (ground layer), a variable resistive layer 104 and a fixed resistive layer 102 being positioned between the first and second conductive contact layers (106, 122 in Fig. 1), and the variation in resistance within the layered material stack 104 being based on one of a first resistive state and a second resistive state of the variable resistive layer (Fig. 1; phase change material such as chalcogenide exhibits different electrical conductivity depending upon its state is well known in its art); when the electron stream is scanned across the layered material stack, generating an output signal associated with one of the first and second resistive states of the variable resistive layer (Fig. 1 and 4, step 208).

However, Gibson does not teach the following:

(i) generating a first magnetic field and a second magnetic field within a transformer in response to the variations in resistance from within the layered material

stack, the transformer being operatively coupled to the first and second conductive contact layers; and

(ii) generating a differential output signal within the transformer based on the first and second magnetic fields, the differential output signal being associated with one of the first and second resistive states of the variable resistive layer.

Libove teaches a current/voltage measuring means having the following:

(i) generating a first magnetic field and a second magnetic field within a transformer in response to the variations in resistance from within the layered material stack, the transformer being operatively coupled to the first and second conductive contact layers (Fig. 22B; the transformer is couple to the conductive means 150; variation of current causes a plurality of magnetic field); and

(ii) generating a differential output signal 163 within the transformer based on the first and second magnetic fields, the differential output signal being associated with one of the first and second resistive states (current/voltage variations) of the variable resistive layer (Fig. 22B).

The storage states of Gibson's recording material 104 cannot be measured directly because the storage area cannot be connected to a conventional current/voltage detecting means.

In order to obtain the resistance state of the storage area in terms of a current flow caused by Gibson's electron beam, it would have been obvious to one of ordinary skill in the art to utilize a transformer means such as Libove's to monitor Gibson's variable resistive layer 104, because the transformer voltage/current measuring means output a signal such as voltage or current which representing the resistance state of the resistance layer.

(b) With respect to Claim 2, the cited prior art of Gibson further teaches that detecting the variation in resistance within the layered material stack 104 comprises detecting a difference in current distribution within the layered material stack in response to the scanning and injection of the electron stream into the layered material stack, the layered material stack having a substrate layer 102 and wherein the second conductive contact layer is a portion of the substrate layer (Fig. 1; variation of the resistance is represented by current difference).

(c) With respect to Claim 6, the cited prior art of Gibson further teaches that detecting the variation in resistance within the layered material stack comprises scanning and injecting the electron stream into the layered material stack (Fig. 1), the layers of the layered material stack 104

having layers of materials that are significantly larger in area than the cross sectional area of the electron stream (Fig. 1).

(d) With respect to Claim 12, the cited prior art of Gibson further teaches that detecting a variation in resistance within the layered material stack in response to a scanning and injection of a non-contacting, remotely sourced electron stream into the layered material stack 104 (Fig. 1).

5. Claims 20, 21, 26 and 27 have limitations similar to those treated in the above rejection, and are met by the references as discussed above. Claim 27 however also recites the following limitation which is also taught by the cited prior art of Libove:

(i) the transformer further comprises a third winding to generate the output signal (Fig. 22B; winding has N turns).

6. Claims 36 and 38 have limitations similar to those treated in the above rejection, and are met by the references as discussed above.

Allowable Subject Matter

7. Claims 29-35 are allowable over prior art.

8. Claims 3-5, 7-11, 22-25, 28 and 37 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. The following is an Examiner's statement of reasons for the indication of allowable subject matter:

As in claims 3, 22 and 37, the prior art of record fails to teach or fairly suggest that detecting the first resistive state of the variable resistive layer in response to a distribution ratio of electrons from the electron stream flowing toward the first conductive contact layer; and detecting the second resistive state of the variable resistive layer in response to a distribution ratio of electrons from the electron stream flowing toward the second conductive contact layer.

As in claims 5 and 28, the prior art of record fails to teach or fairly suggest that generating the first and second magnetic fields within the transformer comprises generating a third magnetic field within the transformer, the transformer having an identical number of turns.

As in claim 7, the prior art of record fails to teach or fairly suggest that passing a first current through a first wire that is operatively coupled to the first conductive contact layer; and wherein generating the second magnetic field comprises passing a second current through a second wire that is operatively coupled to the second conductive contact layer; and wherein generating the differential output signal comprises positioning a sensor between the first and second wires to detect a vector sum of the first and second magnetic fields.

As in claim 8, the prior art of record fails to teach or fairly suggest that generating the first and second magnetic fields within the transformer comprises generating a net magnetic field within a center-tapped transformer.

As in claim 9, the prior art of record fails to teach or fairly suggest that the layered material stack comprises the variable resistive layer underlying the first conductive contact layer, the fixed resistive layer underlying the variable resistive layer, and the second conductive contact layer underlying the fixed resistive layer.

As in claim 10, the prior art of record fails to teach or fairly suggest that the layered material stack further comprises a third resistive layer located between the first and second conductive contact layers.

As in claim 23, the prior art of record fails to teach or fairly suggest that the layered material stack comprises the variable resistive layer underlying the first conductive contact layer, the fixed resistive layer underlying the variable resistive layer, and the second conductive contact layer underlying the fixed resistive layer.

As in claim 24, the prior art of record fails to teach or fairly suggest that the layered material stack comprises the fixed resistive layer underlying the first conductive contact layer, the variable resistive layer underlying the fixed resistive layer, and the second conductive contact layer underlying the variable resistive layer.

As in claim 25, the prior art of record fails to teach or fairly suggest that the layered material stack further comprises a third resistive layer located between the first and second conductive contact layers.

As in claim 29, the prior art of record fails to teach or fairly suggest that a transformer having a first winding operatively coupled to the first conductive contact layer to provide the anode voltage from the power supply to the first conductive contact layer, a second winding operatively coupled to the second conductive contact layer to provide the anode voltage from the power supply to the second conductive contact layer, and a third winding configured to output a

signal associated with one of a first resistive state and a second resistive state of the variable resistive layer in response to the difference between a first magnetic field and a second magnetic field generated by the first and second windings, the first and second windings being in a differential configuration relative to each other to generate the first and second magnetic fields based on a difference in current, and to detect a difference in current between the first and second conductive contact layers in response to the injection and distribution of the electron stream into the material stack.

The features indicated above, in combination with the other elements of the claims, are not anticipated by, nor made obvious over, the prior art of record.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Gilgen (6,147,395) is pertinent because Gilgen teaches a phase change recording medium having high and low resistive recording regions under an electron beam irradiation.

Yamamoto (5,982,568) is pertinent because Yamamoto teaches a magneto resistive detecting means.

Kaiser et al. (5,293,781) is pertinent because Kaiser teaches a magnetometer having a conductive loop.

11. Any inquiry concerning this communication or earlier communication from the examiner should be directed to Kim CHU whose telephone number is (571) 272-7585 between 9:30 am to 6:00 pm, Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Korzuch, can be reached on (57) 272-7589.

The fax number for the organization where this application or proceeding is assigned is (571) 273-8300

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished application is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9191 (toll free).

Kim-Kwok CHU

KC 10/16/2006

Examiner AU2627
October 16, 2006

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